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THE VISHNEVAYA MOUNTAIN-CHKALOV-URAL'SK-CASPIAN SEA
STATE SHELTER BELT

A. A. Yerokhina

The state shelter belt which is to run from Vishnevaya Mountain to the Caspian Sea will be planted along the banks of the Ural River.

A basic and important problem concerning this belt which has not yet been solved is the location of the southern part of the belt which will cross the Caspian Lowland. The necessity of locating this sector of the belt on the flood plain in view of extremely unfavorable forest growing conditions was decided upon in principle at a meeting of the Scientific Council of the Main Administration for Field Shelter Belt Planting in March 1949. However, concrete problems arising in connection with location of the belt on the flood plain were not solved, and it was proposed to solve them after soil studies by scientific research institute expeditions had been completed.

Location of the belt on the flood plain must be related to the composition of ground water and its height above the level of the river. Where ground water on the flood plain has been salinized to a degree below the level of toxicity, it is possible to locate the belt on the high flood plain terrace; but where the content of water-soluble salts, especially chlorine, is above the toxicity mark, the belt must be established on the embankment near the bed of the river (according to the prepared plan). The question concerning location of the belt in sectors where the river meanders considerably and where the flood plain becomes narrow on one side of the river, as well as certain other questions, must also still be answered.

The most difficult region in the northern sector of the belt located in Chkalov and Aktyubinsk oblasts is that region in the so-called "Guberlinskiye Gori" where the Ural River cuts through the aboriginal rocks of the Ural Mountains. The unsuitableness of this region for forest growing due to the broken and craggy nature of the area, the very inconsiderable amount of weathering products, and the small amount of precipitation caused a special commission, which inspected this sector on the spot, to conclude that the belt would have to be interrupted here. However, this conclusion cannot be considered final. A final decision depends on the results of regional studies made by an expedition of the Academy of Sciences USSR.

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Soil scientists take part in the work of all expeditions along the Ural River. Medvedev, Timofeyev, and others of the Ministry of Agriculture, who know the soils of the southern regions, accompanied by foresters, precede each group of surveyors and select the sectors most favorable for forest growing, thereby carrying out the plan, and sometimes revising it considerably. Soil characteristics of the shelter belt route are noted by the soil scientists, and as a result of their field work, a soil map of the belt route will be produced.

A detailed soil survey is being carried out and maps are being compiled for the technical planning work. This work is being carried out under the supervision of soil scientists A. F. Tsyganenko and V. D. Kucherenko, members of the Agrolesproyekt (Agriculture-Forestry Project) expedition. The survey and maps are to be of service especially in planning the species of trees to be planted and the agricultural techniques to be employed. P. P. Prudentov, chief engineer of the expedition, has rendered much assistance to all the soil scientists by arranging for aerial photographing of the shelter belt route and by providing them with excellent topographical material in the right scale.

Scientific workers of various institutes of the Academy of Sciences USSR have taken an active part in the work of planning the Ural shelter belt and carrying it out. In March 1949, S. A. Nikitin of the Forestry Institute and A. A. Yerokhina of the Soil Institute served as on-the-spot advisers to the expedition, and in April, when the project was under discussion in the Main Administration for Field Shelter Belt Planting, Nikitin, Yerokhina, S. I. Sokolov of the Kazakhstan Academy of Sciences, and Ye. N. Ivanova served on the Ural Commission. In May, these scientists, with workers of the Institute of Geography, inspected the entire route of the shelter belt.

Using a soil map, the soil scientists grouped the soils according to their adaptability for forest growing and made a plan of the species to be used and the main agricultural techniques to be employed. The following preliminary grouping of the soils of Chkalov Oblast was set forth, together with a guide on the agricultural measures to be carried out and the species of trees to be selected.

GROUPING OF SOILS OF CHKALOV OBLAST FOR AGRICULTURAL AND FOREST DEVELOPMENT PURPOSES

A. Soils Suitable for Forest Growing

1. Soils with a light mechanical composition (light clayey loams and sandy loams, both on light friable sedimentary rock)

a. Class I -- Fertile, ordinary, and southern chernozems. These are subdivided into leached, moderately thick, and thin.

b. Class Ia -- Dark chestnut soils

Agricultural measures to be taken in utilizing soils in Classes I and Ia include: accumulation and preservation of moisture, increase of organic matter, and erosion control on plowland with thin (eroded) soils. Species adapted to soils with light mechanical composition are to be chosen.

2. Soils with a heavy mechanical composition (clays, heavy clayey loams, deluvial and eluvial-deluvial clayey loams, and thick eluvium on massive rocks

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a. Class Ib -- Moderately thick fertile chernozems, podsolized chernozems, dark gray podsolized mountain soils, leached fertile chernozems, dark gray forest soils, and mountain chernozems

Agricultural measures customary for forest steppe regions are to be taken.

b. Class II -- Ordinary moderately thick chernozems, southern moderately thick chernozems, and dark chestnut soils

Agricultural measures to be taken include accumulation of moisture and an increase of organic matter. Drought-resistant species are to be chosen.

c. Class IIa -- Meadow chernozems and meadow chestnut soils

An agricultural measure to be taken is prevention of salinization.

d. Class III -- Solonized ordinary chernozems, solonized southern chernozems, and solonized dark chestnut soils

Agricultural measures to be taken include: accumulation of moisture; sometimes, treatment with gypsum; increase of organic matter; and erosion control. Drought-resistant and salt-tolerating species are to be chosen.

B. Soils Suitable for Forest Growing Only When Basic Soil Improvement Work Is Carried Out

Class IV -- Residual solonets (on salinized rocks), meadow solonets, and meadow solonchaks

C. Soils Unsuitable for Forest Growing (on Massive Rocks Under Conditions of Disjointed Relief)

Class V -- Ordinary chernozems, southern chernozems, and dark chestnut soils.

The following conditions make forest growing impossible: high degree of rockiness, thinness or absence of eluvium layer, small amount of precipitation, and high rate of drainage.

There is no doubt that this grouping will have to be made more precise; in particular, the mother rock (which sometimes plays a decisive role when salinized), the sectors with disjointed relief (heterogeneous as to moisture qualities), and other features will have to be studied more thoroughly. In 1950, when the basic studies will be made and the office work undertaken, the role to be played by soil scientists in connection with this very complex and difficult shelter belt route will become even greater.

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